REMARKS

Claims 1-30 are pending. Claims 19-30 have been added to further define aspects of the present invention for which Applicants believe are patentable. The Office Action dated August 23, 2002 has been carefully considered. Applicants request that the Examiner consider the above amendments and the following remarks, and pass the application to allowance.

Response to 35 U.S.C. § 102(e) Rejections:

Claims 1-5 and 9-13 were rejected under 35 U.S.C. § 102(e) as being anticipated by Ochoa et al. (U.S. Patent No. 6,054,682).

Ochoa et al. relates to a system and method for assembling components on a circuit board. The system includes a thermal chamber for receiving a plurality of components therein and for heating the plurality of components at a predetermined temperature for a predetermined length of time. An outfeed slot located on a wall of the thermal chamber allows at least one component from the plurality of components to pass therethrough and emerge externally of the thermal chamber. A pick and place machine, located adjacent to the thermal chamber, which automatically retrieves the components which have passed through the outfeed slot and automatically places the components onto a designated circuit board. Ochoa et al., however, does not teach or suggest a dry atmosphere component storage area.

Claim 1 as amended recites a component placement machine for placing components on printed circuit boards. The machine includes a dry atmosphere component storage area; a component placement system for taking components from the component storage area and placing the components on the printed circuit boards; an enclosure surrounding the component storage area; and a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components. (Emphasis added.)

In Ochoa et al. "a pressurized control system is attached to the thermal oven described above to maintain a pressure other than atmospheric within at least a portion thereof. Ideally, a vacuum is maintained within the oven during heating, thereby reducing the water vapor pressure within the oven and allowing for the use of lower conditioning temperatures, or alternatively, reduced conditioning times at the same temperature. Additionally, an inert gas or other fluid may be used to purge the oven during operation, or during periods of non-use, if desired." Col. 4, lines 58-67. As set forth above, Ochoa et al. does not teach or suggest a dry atmosphere component storage area. Rather, a vacuum is maintained within the oven during heating or, alternatively, an inert gas or other fluid is used to purge the oven during operation or during periods of non-use, if desired. Accordingly, since Ochoa et al. does not teach or suggest a dry atmosphere component placement machine having a component storage area, Claim 1 should be allowable. Claims 2-5 are dependent from Claim 1 and should also be allowable for the reasons set forth above.

Claim 9, as amended, recites a method of mounting electronic components on a printed circuit board. The method includes storing electronic components in a dry atmosphere in a storage area of a surface mount device placement machine; maintaining the dry atmosphere in the storage area by enclosing the storage area and injecting dry gas into the storage area; removing the components from the storage area; and mounting the components on a printed circuit board. (Emphasis added.)

As set forth above, Ochoa et al. does not teach or suggest storing electronic components in a dry atmosphere in a storage area of a surface mount device placement machine. Rather, "a vacuum maintained within the oven during heating or, alternatively, an inner gas or other fluid may be used to purge the oven during operation, or during periods of non-use, if desired." Col. 4, lines 58-67. Accordingly, since Ochoa et al. does not teach or suggest storing electronic components in a dry atmosphere in a storage area of

a surface mount placement machine, Claim 9 should be allowable. Claims 10-13 are dependent from Claim 9 and should be allowable set forth above.

Response to 35 U.S.C. § 103(a) Rejections:

Claims 6-8 and 14-17 were rejected under 35 U.S.C. § 103(a) as being anticipated by Ochoa et al. (U.S. Patent No. 6,054,682) in view of Vander Velde (U.S. Patent No. 5,365,779).

Claim 6 has been rewritten in independent form to recite a component placement machine for placing components on printed circuit boards. The machine includes a component storage area; a component placement system for taking components from the component storage area and placing the components on the printed circuit boards; an enclosure surrounding the component storage area; and a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components, wherein a flow rate of the dry gas delivered to the storage area is controlled by a control system including a humidity sensor within the component storage area.

Vander Velde relates to a method and apparatus for the corrosion condition evaluation of unbonded prestressing elements in a post-tension concrete structures. The method involves locating a prestressing element in the structure and providing at least two openings in the structure at positions along the length of the element. One of the openings is an inlet port and the other is an outlet port, each of the ports permitting communication with the gaseous environment within a conduit surrounding the prestressing element. The gaseous environment is accessed through the outlet port by extracting a sample of gas therethrough. The sample is then measured to determine its humidity and thereby evaluate the corrosion condition of the prestressing element between the inlet port and the outlet port. Vander Velde, however, does not teach or suggest that the humidity sensors are within the component storage area. Rather, the gaseous environment is accessed through

the outlet port by extracting a sample of gas which is then measured to determine its humidity. Accordingly, since Vander Velde does not teach a humidity sensor within the component storage area, Claim 6 should be allowable.

Claim 7 has also be rewritten in independent form and recites a component placement machine for placing components on printed circuit boards. The machine includes a component storage area; a component placement system for taking components from the component storage area and placing the components on the printed circuit boards; an enclosure surrounding the component storage area; and a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components, wherein the dry gas is delivered to the component storage area at a first flow rate when the storage area is open and is delivered at a second flow rate when the storage area is closed.

As set forth above, Vander Velde does not teach or suggest that the dry gas is delivered to the component storage area at a first flow rate when the storage area is open and a second flow rate when the storage area is closed. Rather, in Vander Velde, a regulator means is used to regulate pressure and flow rate of the dry gas "whereby said gaseous environment within the conduit means is subjected to a flow of said dry gas from said supply means and through said inlet port, said regulator means being adjusted to provide said flow of dry gas at a pressure for a time sufficient to extract a sample of said gaseous environment through said outlet port to said means for sampling an measurement of humidity of said sample and thereby evaluate the corrosion condition of said prestressing element between said inlet port and said outlet port." Col. 5, lines 23-33. Although Vander Velde descibes a first flow rate for an unobstructed flow and a second flow rate which is higher for a block conduit, the flow rates do not correspond to a flow rate for a storage area being open requiring a relatively high first flow level and a second lower flow rate for maintenance when the storage area is in a closed position. Thus, the first flow rate in the

storage being open and being delivered at a flow rate when the storage area is closed is not taught nor suggested by Vander Velde. Accordingly, Claim 7 should be allowable. Claim 8 is dependent from Claim 7 and should be allowable for the reasons set forth above.

Claim 14 recites the method of Claim 9, wherein the dry atmosphere in the storage area is provided by delivering a dry gas to the storage area. As set forth above, Ochoa et al. does not suggest or teach storing electronic components in a dry atmosphere in a storage area of a surface mount device placement machine. Accordingly, Claim 14 should be allowable. Claims 15-17 are dependent from Claim 14 and/or Claim 16 and should be allowable for the reasons set forth above.

Claim 18 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ochoa et al. in view of Alles et al. (U.S. Patent No. 5,297,438).

Claim 18 recites the method of Claim 9, further comprising removing about 0.1% or more of the weight of the component by elimination of moisture while the components are stored in the storage area. As set forth above, Ochoa et al. does not suggest or teach storing electronic components in a dry atmosphere in a storage area of a surface mount device placement machine. Accordingly, Claim 18 should be allowable.

New Claims 19- 30:

New Claims 19-30 have been added to further define aspects of the present invention for which Applicants believe are patentable.

Claim 19 recites the machine of Claim 1, wherein the components to be placed on the printed circuit boards are stored in the dry atmosphere within the machine and are not exposed to moisture during this storage time.

Claim 20 recites the machine of Claim 1, further comprising a heater for heating the dry gas.

Claim 21 recites the machine of Claim 1, further comprising a flow meter for regulating the flow of the dry gas to the storage area.

Claim 22 recites the machine of Claim 1, further comprising a multiplicity of inlets to provide a consistent dry atmosphere around all of the components in a storage area.

Claim 23 recites the machine of Claim 22, wherein the multiplicity of inlets includes a sprayer or a diffuser.

Claims 24, 25 and 29 recite the machine of Claims 1, 6 and 7, respectively, wherein the components to be placed on the printed circuit boards maintain a dry atmosphere without heating.

Claim 26 recites the machine of Claim 7, further comprising a controller for automatically regulating the first flow rate and the second flow rate sensing a location of a door in an open or closed position.

Claim 27 recites the machine of Claim 7, further comprising intermittently turning on and off the flow rate when the relative humidity set point is reached.

Claim 28 recites the machine of Claim 7, further comprising adjusting the flow rate to maintain a preset relative humidity point when the relative humidity set point is reached.

Claim 30 recites the method of Claim 9, wherein the step of maintaining the dry atmosphere is performed without heating the components.

Since none of the art cited teaches or suggests a component placement machine for placing components on printed circuit boards having a dry atmosphere component storage area and/or wherein the dry gas is delivered to the component storage area at a first flow rate when the storage area is open and delivered at a second flow rate when the storage area is closed, Claims 19-30 should be allowable.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made."

It is respectfully submitted that Claims 1-30 are presently in condition for immediate allowance, and such action is requested. If, however, any matters remain that could be clarified by Examiner's Amendment, the Examiner is cordially invited to contact the undersigned by telephone at the number below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: _____

Kirk M. Nuzum
Registration No. 38,983
Redwood Shores, California Office
(650) 622-2337

P.O. Box 1404
Alexandria, Virginia 22313-1404
(650) 622-2300

Date: 11-21-2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A component placement machine for placing components on printed circuit boards, the machine comprising:

a dry atmosphere component storage area;

a component placement system for taking components from the component storage area and placing the components on the printed circuit boards;

an enclosure surrounding the component storage area; and

a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components.

6. (Amended) [The] A component placement machine [of Claim 1,] for placing components on printed circuit boards, the machine comprising:

a component storage area;

a component placement system for taking components from the component storage area and placing the components on the printed circuit boards;

an enclosure surrounding the component storage area; and

a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components, wherein a flow rate of the dry gas delivered to the storage area is controlled by a control system including a humidity sensor within the component storage area.

7. (Amended) [The] A component placement machine [of Claim 1,] for placing components on printed circuit boards, the machine comprising:

a component storage area;

a component placement system for taking components from the component storage area and placing the components on the printed circuit boards;

an enclosure surrounding the component storage area; and

a dry gas delivery system for delivery of a dry gas to the storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components, wherein the dry gas is delivered to the component storage area at a first flow rate when the storage area is open and is delivered at a second flow rate when the storage area is closed.

9. (Amended) A method of mounting electronic components on a printed circuit board, the method comprising:

storing electronic components in a dry atmosphere in a storage area of a surface mount device placement machine;

maintaining [a] the dry atmosphere in the storage area by enclosing the storage area and injecting dry gas into the storage area;

removing the components from the storage area; and

mounting the components on a printed circuit board.